ENVIRONMENTAL Fact Sheet

NEW HAMPSHIRE DEPARTMENT OF Environmental Services

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Minimizing the Impact of Development on Wildlife: Actions for Local Municipalities

The rapid increase in human population and rate of development in New Hampshire is placing significant stress on our native wildlife populations. Land that was once habitat for wildlife species is being converted into residential and commercial subdivisions, roads, and other uses. The development of land and related activities impact both the quantity and quality of wildlife habitat. This fact sheet provides an overview of those impacts and offers some strategies for developers and towns to reduce the impact of development on native wildlife. This fact sheet is part of a two-part series; a second fact sheet focuses on habitat-sensitive site design and development practices.

How Development Impacts Wildlife

Habitat Loss

The loss of habitat through the conversion of land from its natural state to a developed landscape represents the single greatest impact of increased human activity on native wildlife. All animal species require certain habitat features to survive. Development typically eliminates or significantly changes many important habitat features found in a natural area, thus reducing or eliminating the habitat value of that area. For example, a diverse wildlife population depends upon the natural diversity of native plants found in most undeveloped areas. Development often changes the vegetative community, making it more difficult for many native species to survive. Those species able to survive in urban settings may thrive, but the rest are forced to find new territory or perish.

Habitat Fragmentation

Habitat fragmentation is a less obvious consequence of development, reducing both the quantity and quality of habitat. Fragmentation is a process whereby large tracts of the natural landscape are gradually developed and subdivided until only patches of original habitat remain. The patches are often too small and too far apart to support the basic survival and reproductive needs of many wildlife species during various stages of their life-cycle or in different times of the year. When a species' habitat is separated by distances that make movement from one patch to another impossible, the impacts on the genetic health of the population are significant and reduce a species ability to reproduce and withstand stress. In addition, smaller habitat patches and the wildlife that depend on them are more vulnerable to the catastrophic effects of natural disturbances such as fire and ice storms. Fragmentation also results in higher populations of generalist predators, resulting in increased predation on those species that attempt to use the remaining habitat blocks.

Changing Landscape

The impact of human activity on wildlife extends beyond the actual area of development. When evaluating the impact of human activity on wildlife, we should consider a "disturbance zone"- the entire area where habitat value has been meaningfully reduced. The encroachment of human activity into a natural area creates more "edge effects." Edge effects are changes in environmental conditions and animal behavior and well-being that result from being in close proximity to the border between habitat areas. Unlike natural borders, human disturbances often create "harder" edges with greater detrimental impacts on wildlife. Even seemingly small manmade disturbances, such as power line easements, can have major consequences for wildlife.

In addition, the encroachment of human activity reduces the amount of interior habitat area relative to edge or border area. While borders between two different habitats are often an essential part of the ecology of an area, when habitat becomes so small that it is all edge and no interior, it loses its ability to support those species that require an isolated interior for some portion of their life (e.g. some nesting birds).

Landscape disturbance caused by development can also serve to introduce invasive species into natural habitats, further degrading the quality of remaining habitat areas.

The Impact of Roads

Roads may be the "single most destructive element of the habitat fragmentation process."
They can:

- Disrupt or prevent passage across the disturbed area.
- Provide an entrance for exotic species or predators.
- Increase mortality.
- Increase unnatural disturbances from sources such as pollution and fire.

Source: Noss, 1993, Schonewald-Cox and Buechner 1990 and Bennett 1991, as cited in Duerksen, et al.

Changing Aquatic Habitat

Development also affects the quality and quantity of aquatic habitat. The more hard surface present after development, the less rainwater infiltrates the soil. Rainwater instead runs off the land at an increased volume and rate. This reduces the recharge of groundwater and increases flooding, streambed erosion, and sedimentation. Runoff from developed areas also is often warmer and polluted with pathogens (e.g. bacteria and viruses), household chemicals, metals, fertilizers, pesticides, oil, and grease. As vegetative buffers along water bodies are lost, sunlight can further warm water beyond a threshold at which native species can survive and reproduce.

The structural habitat of aquatic systems also can be significantly degraded by modifications associated with roads and development. The quality and flow of rivers, streams and wetlands can be reduced by inadequate or inappropriately designed culverts, creation of new dams, and channel straightening or modification.

Daily Human Activity

Human activity introduces changes to the surrounding environment that can negatively impact natural habitat. Changes in lighting in an area, for example, can significantly affect some species'

behavioral and biological rhythms, which are guided by natural cycles of light and dark. Nocturnal species, particularly birds, can become disoriented by night-time lighting. Domestic pets, particularly cats, may prey excessively on wildlife, such as ground-nesting birds. The availability of household trash can alter the composition of wildlife communities by providing food for animal populations that thrive on trash (such as rats, raccoons, and skunks) to the detriment of those that do not, e.g. small mammals and song birds.

Human recreational activity in an area may directly impact wildlife and reduce the quality of the habitat provided. Human activities can disturb sensitive habitats, like wetlands, and disturb or "flush" wildlife. Flushing wildlife raises an animals' stress level and increases energy consumption. If repeated frequently, such disturbance can impact reproduction and survivorship.

Examples of Important Habitat

Habitat of Rare Wildlife Species - Lands inhabited by species listed as endangered, threatened, or of special concern should be considered a priority for conservation.

Unfragmented Lands - Large tracts of contiguous open space that feature a mix of habitat types are more valuable to wildlife than small, fragmented patches.

Riparian Areas & Shorelines - The interaction of land and water fosters biodiversity and is invaluable for many reptiles, amphibians, and migratory birds.

Priority Wetlands - Swamps, marshes, tidal flats, wet meadows, and bogs. For a legal definition see New Hampshire Code of Administrative Rules Wt 101.82.

Agricultural and Other Open Land - Some species are dependent on open fields, an increasingly rare habitat type.

Connecting Lands - Areas of very-low development density between large unfragmented lands that provide wildlife with habitat, food, and cover, as well as corridors for movement.

Other Unique or Critical Habitats - Habitat types that are rare state-wide or to a particular geographic region are vital for maintaining regional biodiversity.

Actions for Local Municipalities

This section offers some basic actions to pursue to reduce the impact of development and human activity on native wildlife.

- **Specifically state habitat conservation goals in your master plan, open space plan, and/or habitat conservation plan.** Development proposals and regulatory changes are more likely to be consistent with a community's habitat conservation goals if those goals and objectives are clearly stated in a town's master plan. If a separate open space plan or habitat conservation plan is prepared, it should be adopted as an official part of the master plan. Including habitat conservation goals and objectives (or other plans focusing on habitat conservation) as part of the local master plan provides the basis for local land use regulations and changes in local zoning to support habitat conservation.
- **Prepare a natural resources inventory (NRI) to identify habitat areas that merit conservation.** Awareness of a town's natural resources is vital to informed decision-making about habitat conservation. A basic natural resources inventory is the first step. This should include a base map, land cover map, wetlands composite map, aerial photographs, tax map, topographic map, and wildlife information (see NRI Guidebook by UNH Cooperative

Extension). Priority areas for habitat conservation can be easily identified by overlaying these maps and noting the co-occurrence of natural resource features important for wildlife. Also, the New Hampshire Fish and Game Department has prepared habitat assessment maps for the entire state in support of New Hampshire's Comprehensive Wildlife Conservation Plan, which is due out by October 1, 2005. Contact Fish and Game for more information.

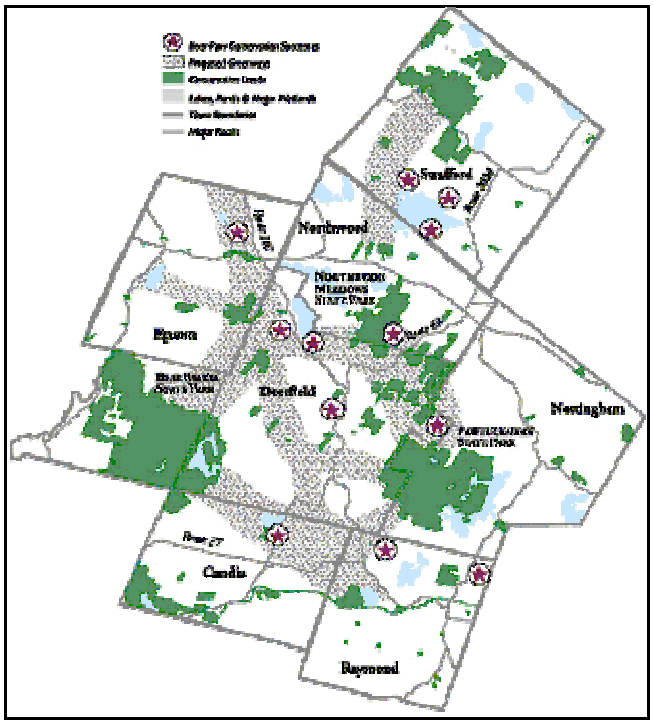
- **Map the town's "green infrastructure" and plan for conservation as well as development within a community.** Natural resource features that are vital to human and wildlife well-being are a community's "green infrastructure." Consideration of these landscape features in open space and habitat conservation plans is essential to comprehensive natural resource planning. Comprehensive planning considers both conservation and development. It is vital to achieving a balance between economics and environmental health, between private property rights and community goals.

Green Infrastructure is an interconnected network of protected land and water that supports native species, maintains natural ecological processes, sustains the quality of air and water resources, and contributes to the health and quality of life for all communities and people.

A basic natural resources inventory (NRI) will help identify green infrastructure as the first step in planning for its conservation. Once specific areas are identified, their locations and an explanation of their importance should be clearly stated in community plans. With appropriate regulatory mechanisms, communities can plan for open space in the same way they plan for transportation networks and other types of development.

For more information on Green Infrastructure see also www.greeninfrastructure.net.

Bear-Paw Regional Greenways Map



- **Revise local zoning and development ordinances to reflect habitat conservation goals cited in local and regional plans.** Developers and communities can work together to reduce the impact on habitat. New lots often have greater value if the natural amenities that make the land attractive in the first place are preserved. A community that provides opportunities for innovative approaches will generally attract a higher quality development. Subdivision and

site plan regulations should include incentives to promote the conservation of habitat, open space, and natural resources. A community also can plan for areas where higher density development is more appropriate to balance reductions in development in areas of greater habitat value.

Muncipalities can strengthen requirements in their local zoning and ordinances:

- Require site-specific natural resource inventories and/or wildlife assessments.
- Require pre-proposal meetings with the planning board where the focus is on understanding the natural resource features of the site and providing input on the potential development plan.
- Require that development proposals demonstrate how they will conserve important habitat features.
- Require conservation-design subdivisions as the preferred format for new residential subdivisions.

- **Ensure that your community has an adequate management plan in place.** Appropriate management of habitat areas can ensure that conservation goals are met and maintained over the long-term. Basic strategies for maintaining the quality of protected habitat include enforcement of use restrictions and regular monitoring of habitat quality.

Examples of Regulatory Options

- Overlay zone for wetlands and streams. Overlay zones establish requirements beyond standard zoning regulations for specified areas.
- Require conservation/open space subdivision design in areas designated by the town as important for habitat conservation.
- Develop a habitat conservation checklist for application review. A checklist may increase adherence by applicants and planning boards to habitat-related objectives and design criteria.
- Transfer of development rights (TDRs) programs redirect development from areas that are a priority for conservation to areas identified by the community as appropriate for growth.
- Encourage maximum setbacks/buffers in projects with important interior wildlife habitat areas. A buffer is a naturally vegetated area adjacent to a habitat area. A setback is a minimum distance between development and an important landscape feature.
- Maintain an additional unfragmented vegetated buffer along roadsides where streams and wetlands cross roads (300 ft. total minimum).

- **Raise funds to purchase development rights to permanently conserve important habitat areas.** Towns have many options for raising funds for land conservation. These include, but are not limited to:
    - Authorization of bonds for purchasing land.
    - Allocation of the land use change tax to a town conservation fund.
    - Private land trusts may provide money for the purchase of conservation lands, as do certain government grant and loan programs.

  For more information, see "Saving Special Places: Community Funding for Land Conservation" (www.spnhf.org/pdf/savingplaces.pdf) by the Society for the Protection of New Hampshire Forests, or contact the Center for Land Conservation Assistance at (603) 224-9945 or the Land and Community Heritage Investment Program at www.lchip.org.

- **Control invasive and exotic species.** To maintain healthy populations of native flora and fauna, invasive and exotic species must be controlled. Invasives are non-native species that

proliferate rapidly and often have no local natural predators. This allows them to out-compete native species, often without filling the natives' vital roles in ecosystems. For more information, visit the website of the NH Invasive Species Program at http://agriculture.nh.gov/divisions/plant_industry/index.htm, NH Exotic Species Program at DES at http://des.nh.gov/wmb/exoticspecies/, or the EPA webpage on invasive species in ocean, coasts, and estuaries at http://www.epa.gov/owow/invasive_species/.

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